

Claim Amendments

1. (Currently amended) A method for forming a uniform lining of refractory material within the interior of a coreless furnace, comprising

providing a lining form having walls dimensioned to provide a uniform space between the liner walls and the interior of the furnace;

providing a carrier for the lining form, said carrier having a structure adapted for concentric location and attachment on top of a lining form, and for carrying the lining form when attached thereto, said carrier further having furnace engagement and locating means for engaging said furnace and locating said lining form, when attached, concentrically within the interior of the furnace, and further having a conical upper surface having an outer diameter substantially equal to the diameter of the lining form;

attaching the carrier concentrically on top of the lining form ~~to provide a carrier-liner assembly;~~

lowering at least part of the carrier-liner assembly lining form into the interior of the furnace while engaging the furnace engagement and locating means of the carrier with said furnace, thereby concentrically locating said lining form within said furnace, and

pouring particulate refractory material onto said conical upper surface, whereby the particulate refractory material is directed into the uniform space between the lining form and the furnace.

2. (Original) The method of claim 1 wherein the particulate refractory material is vibrated for compaction within the space between the lining form and the furnace.

3. (Original) The method of claim 2 wherein a fixture is provided interconnecting the lining form and the furnace during vibration of the particulate refractory material to maintain the lining form concentric with respect to the furnace.

4. (Original) The method of claim 3 wherein said fixture is provided by providing a holding bar adapted to be fastened to the lining form, fastening the holding bar within the lining form at its top, and providing a main bar adapted to be connected between the holding bar and the furnace, said main bar having clamping mechanisms for cooperating with the holding bar, and further having engagement and holding means for engaging the furnace, and attaching the engagement and holding means of the main bar to the furnace and the clamping mechanisms of the main bar to the holding bar, thereby holding the lining form concentric with respect to the furnace during vibration of the refractory material.

5. (Currently amended) A carrier adapted for the formation of a refractory lining of uniform thickness on the interior of a furnace, with the use of a lining form having a cylindrical side wall and a closed bottom and providing, when concentrically supported within the furnace, a uniform space between its exterior surface and the interior surface of the furnace, said carrier comprising:

a lifting structure adapted for concentric location on and attachment to the top of the lining form and having engaging and locating means adapted for engagement with the furnace and for location of the lining form, when attached, concentrically within the furnace, said carrier further having a conical upper surface with the outside diameter of its lowest edge being substantially equal to the outside diameter of the lining form,

said lining form and carrier having complementary mating means for fastening said carrier to said lining form ~~to provide a carrier liner assembly,~~

wherein the placement of at least part of said ~~carrier liner assembly~~ lining form within said furnace with said engaging and locating means of the carrier engaged with the furnace locates said lining form concentrically within the furnace to provide a uniform space between the lining form and the surface, and wherein particulate refractory material poured onto the conical upper surface is directed into the concentric space.

6. (Original) The carrier of claim 5 wherein the engaging and locating means of the carrier comprise a pair of guide bushings adapted for engagement with a pair of guides installed in alignment holes formed in the furnace.

7. (Original) A fixture for retaining a lining form concentric within the furnace during compaction of refractory materials, comprising

a pair of locking means for installation in a pair of alignment holes formed in the furnace,

a holding bar adapted to be fastened to attachment means formed inside the top of the lining form, and

a main bar carrying engagement and holding means for engaging the locking means of the furnace when installed on the furnace, and locking mechanisms for clamping to the holding bar, whereby the main bar and the holding bar, when connected together and to the furnace, provide a rigid structure to hold the lining form concentric within the furnace.

8. (Original) The fixture of claim 7 wherein said locking mechanisms comprise a plurality of pressure-actuated piston/cylinder units carried by said main bar, the pistons of each of said piston/cylinder units carrying a set of self-clamping jaws adapted to engage and grip the holding bar as the piston is driven by pressure applied to cylinders of the piston/cylinder units.

9. (Currently amended) A method for forming a uniform lining of refractory material within the interior of a coreless furnace, comprising:

providing a lining form having walls dimensioned to provide a uniform space between the liner walls and the interior of the furnace;

providing a carrier for the lining form, said carrier having a structure adapted for concentric location and attachment on top of a lining form, and for carrying the lining form when attached thereto, said carrier further having furnace engagement and locating means for engaging said furnace and locating said lining form, when attached, concentrically within the interior of the furnace;

attaching the carrier concentrically on top of the lining form ~~to provide a carrier-liner assembly~~; and

lowering at least part of the carrier-liner assembly lining form into the interior of the furnace while engaging the furnace engagement and locating means of the carrier with said furnace, thereby concentrically locating said lining form within said furnace, and providing a uniform space therebetween.

10. (Original) The method of claim 9 wherein the carrier has an upper surface shaped to slope downwardly from its center to its peripheral edge, and particulate refractory material is poured on the upper surface and conveyed thereby into the uniform space between the lining form and furnace.

11. (Original) The method of claim 10 wherein the upper surface is a cone having a peripheral edge adjacent the top of the lining form with a diameter substantially equal to the diameter of the lining form.

12. (Currently amended) A carrier for a lining form adapted to form a refractory lining of uniform thickness at the interior furnace walls, with the use of a lining form having a cylindrical side wall and a closed bottom and providing, when concentrically supported within a furnace, a uniform space between its exterior surface and the interior surface of the furnace, said carrier comprising:

a lifting structure adapted for concentric location on and attachment to the top of the lining form and having engaging and locating means adapted for engagement with the furnace and for location of the lining form, when attached, concentrically within the furnace,

said lining form and carrier having complementary mating means for fastening said carrier to said lining form ~~to provide a carrier-liner assembly,~~

wherein the placement of at least part of said lining form ~~carrier-liner assembly~~ within said furnace with said engaging and locating means of the carrier engaged with the furnace locates said lining form concentrically within the furnace to provide a uniform space between the lining form and the surface.

13. (Original) The carrier of claim 12 wherein the engaging and locating means of the carrier comprise a pair of guide bushings adapted for engagement with a pair of guides installed in alignment holes formed in the furnace.

14. (Original) The carrier of claim 12 further comprising an upper surface shaped to slope downwardly from adjacent its center to its peripheral edge, said peripheral edge lying closely adjacent the upper end of the lining form, when attached to the carrier.

15. (Original) The carrier of claim 12 wherein the carrier is adapted for concentric location on and attachment to the top of the lining form by a collar at its bottom with an inside diameter adapted to concentrically engage the top of the lining form, said complementary mating means comprising a plurality of guides on said collar for guiding a plurality of pins for engagement with a plurality of staples on top of the lining form.

16. (New) A method comprising the steps of:

providing a lining form having at least one exterior wall disposable in an interior of a furnace having at least one interior wall;

providing a carrier having a directing surface, aligning means, and a structure attachable to the lining form;

installing at least a part of the lining form into the interior of the furnace while engaging the aligning means with the furnace, thereby creating a substantially uniform space between the at least one exterior wall and the at least one interior wall;

pouring refractory material onto the directing surface that directs the refractory material into the uniform space, yielding a substantially uniform lining in the interior of the furnace.

17. (New) The method of claim 16, further comprising the step of attaching the carrier to the lining form.

18. (New) The method of claim 16, wherein the carrier is provided with the capability of carrying the lining form when the lining form is coupled with the carrier.